436l Metabolic Engineering of *Artemisia Annua* Hairy Roots

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Malaria claims the lives of over one million people each year. One strain *Plasmodium falciparum* has developed resistance to the popular treatments. *Artemisia annua* produces the compound artemisinin which has been shown to have potent anti-malarial properties. Artemisinin and its derivatives kill the parasites causing malaria with few side effects. So far no resistance to these drugs has been observed. Production of artemisinin from fields of *A. annua* plants have been unable to keep up with the demand, making the artemisinin based anti-malarial drugs scarce and expensive.

In our laboratory, we are interested in the metabolic engineering of the pathways leading to artemisinin and the subsequent affects in *A. annua* hairy roots. We believe that the availability of an inducible promoter could facilitate improved metabolic engineering studies by allowing for the investigation of temporal effects, providing an improved negative control against clonal variation, and avoiding the potentially deleterious effects of constitutive expression. Additionally, 1-deoxy-D-xylulose-5-phosphate synthase (DXS) has been identified as a limiting rate reaction in the formation of IPP, a valuable precursor in the production of artemisinin. In this presentation we will be discussing the generation of two *A. annua* hairy root lines: one containing the glucocorticoid inducible promoter with the green fluorescent protein as a maker protein and one containing DXS under the control of the glucocorticoid inducible promoter.